RESEARCH PROJECT SEGMENT

State: Alaska

Project No.: F-9-3 *Name:* Sport Fish Investigations of Alaska.

Study No.: G-II *Study Title:* Sport Fish Studies.

Job No.: G-II-C *Job Title:* Population Studies of Anadromous Fish Populations - Southwestern Kenai Peninsula.

Period Covered: July 1, 1970 to June 30, 1971.

ABSTRACT

A creel census conducted during the king salmon, Oncorhynchus tshawytscha, punch-card fishery on three lower Kenai Peninsula streams resulted in an observed catch of 202 fish over 20 inches (50.8 cm) in length. The observed and punch-card reported data were projected for a total harvest of 505 fish; 54.7% were harvested from the Ninilchik River.

Punch-card returns from the Kenai River indicated a catch of 237 king salmon over 20 inches in length. The peak of the harvest occurred between June 20 and June 26 when 26.2% of the catch was taken.

Due to adverse weather conditions, no aerial surveys were conducted. A foot survey of the Anchor River indicated a minimum escapement of 1,850 king salmon, the highest escapement since this study commenced in 1960.

Age group 1.3 dominated the harvest in the Anchor and Ninilchik rivers, contributing 54.4 and 55.0% of the catch, respectively.

Results of a silver salmon, O. kisutch, tagging study initiated in the Mud Bay area of Kachemak Bay are presented.

RECOMMENDATIONS

1. Delineate silver salmon spawning areas for establishing index sites to determine relative yearly abundance.

2. Discontinue the present quota of 200 king salmon over 20 inches in length for the Kenai Peninsula. Data indicates that the king salmon fishery cannot be effectively managed within this quota.

3. Continue the silver salmon tagging study in the Mud Bay area of Kachemak Bay to determine the migration pattern of stocks utilizing this area.

4. Construct a weir on the south fork of the Anchor River to determine the population structure, abundance, distribution, and timing of anadromous stocks.

OBJECTIVES

1. To determine the sport fish catch of anadromous fishes, with major emphasis on king salmon, and evaluate angling pressure on the fresh waters of the southwestern Kenai Peninsula.

2. To investigate and evaluate population trends for king salmon in the major recreational fishing waters of the southwestern Kenai Peninsula.

3. To investigate, evaluate, and develop plans for the enhancement of anadromous fish stocks, to provide recommendations for their management, and to direct the course of future studies.

TECHNIQUES USED

Creel census of Kenai Peninsula king salmon punch-card fisheries has been described by Engel (1967).

King salmon escapements were estimated by foot surveys and have been described by Logan (1964) and Engel (1965).

Scale samples were collected from sport-caught adult king salmon and read by microprojector to determine age structure.

Silver salmon were captured by commercial seine boats and marked with Petersen disc tags in the Mud Bay area of Kachemak Bay. Recovery and enumeration were accomplished by foot surveys, a partial creel census of the Anchor River, and by monitoring the commercial and subsistence harvests.

FINDINGS

Area descriptions and prior information pertinent to this project are presented in Annual Reports of Progress by Dunn (1961); Logan (1962, 1963, 1964); Engel (1965, 1966, 1967); Redick (1968); McHenry (1969); and Watsjold (1970).

In 1966, the Alaska Board of Fish and Game established a quota of 500 king salmon, Oncorhynchus tshawytscha, over 20 inches in length for the Kenai Peninsula. This quota remained in effect through 1968. In view of the low 1968 escapement, the Alaska Board of Fish and Game reduced the quota to 200 fish. This quota was continued in 1970.

The areas open to king salmon fishing have been previously described by Dunn (1961). In 1969, the Kenai River king salmon season was open from July 19 through July 27. In 1970, the season was extended from May 30 through July 31, a period of 63 days.

King Salmon Studies

Harvest:

To estimate when the Kenai Peninsula quota of 200 king salmon over 20 inches in length had been reached, an intensive creel census was conducted on Deep Creek and the Anchor and Ninilchik rivers. The census commenced on May 30 and remained in effect until the termination of the fishery by field announcement on May 31. The decision to close the fishery was based on an observed catch of 186 fish on May 30.

Table 1 presents the observed and known king salmon harvest on three lower Kenai Peninsula streams. The known harvest was computed by adding the number of fish creel checked to the number of fish not creel checked but reported by punch-card returnees. The Ninilchik River accounted for the majority of the harvest (54.7%) while the Anchor River and Deep Creek contributed 33.7 and 11.6%, respectively.

The higher Ninilchik River catch may be attributed to low, clear water which prevailed during the fishery. Much of the expected angler pressure on the Anchor River and Deep Creek was diverted for this reason.

TABLE 1 Observed and (Known) King Salmon Harvest and Distribution of Three Lower Kenai Peninsula Streams, 1970.

Date	Anchor River		Ninilchik River		Deep Creek		Cum. Totals	
5/30	69	(104)	105	(184)	12	(33)	186	(321)
5/31	0	(41)	14	(51)	2	(17)	16	(109)
Total	69	(145)	119	(235)	14	(50)	202	(430)

Examination of Table 2 indicates a gradual shift in the percent of annual harvest from the Anchor to the Ninilchik River. This trend should not be interpreted as a decline in Anchor River king salmon populations, but rather as a shift in angler preference primarily because of more favorable water conditions.

TABLE 2 Percent Contribution to the Annual King Salmon Harvest of Three Lower Kenai Peninsula Streams, 1966-1970.

Year	Anchor River	Ninilchik River	Deep Creek	Cum. Totals
1966	51.9	31.4	8.7	100.0
1967	44.1	21.9	34.0	100.0
1968	40.5	33.8	25.7	100.0
1969	33.0	51.3	15.7	100.0
1970	33.7	54.7	11.6	100.0
1966-1969 Average	42.4	36.6	21.0	100.0

A total of 16,687 king salmon punch cards were issued in 1970. Of these, 12,518 (75.0%) were voluntarily returned, which is similar to the 1966-1969 average of 74.9% (Table 3). The number of punch cards issued was 149.8% greater than the 6,680 issued in 1969. The reason for this increase is not known, but is probably related to the longer season on the Kenai River.

TABLE 3 Summary of Cook Inlet King Salmon Punch Cards Issued and Returned, 1966-1970.

Year	No. Issued	No. Returned	% Returned
1966	8,853	6,835	77.2
1967	5,977	4,909	82.1
1968	9,524	6,724	70.6
1969	6,680	4,651	69.6
1970	16,687	12,518	75.0
1966-1969 Average	7,759	5,780	74.9

The returnees reported a harvest of 393 king salmon from lower Kenai Peninsula streams. Eleven fish were reported taken in the marine area of Cook Inlet. In some cases anglers indicated they took fish in salt water off the mouths of the lower Kenai Peninsula streams. These fish were considered taken in fresh water and were credited to the appropriate stream.

Of the anglers returning punch cards, 5,595 (44.7%) indicated they fished king salmon. Of the anglers that fished king salmon, 46.6% indicated they fished the Kenai Peninsula and reported a success rate of 21.5% (Table 4).

TABLE 4 Summary of Information from Kenai Peninsula King Salmon Punch-Card Returns, 1970.

No. Fished	Successful Anglers	Unsuccessful Anglers	% Successful Anglers
2,610	560	2,050	21.5

Redick's (1968) ratio was used to estimate the number of fish caught by punch-card non-returnees.

Fish Creel Checked	Punch card returned / Punch card not returned	=	Fish not Creel Checked	Punch card returned / Punch card not returned

$$\frac{152}{50} = \frac{228}{x}$$

$$x = 75$$

This ratio estimated a total catch composed of:

Total fish creel-checked	202
Punch cards returned, fish not checked	228
Punch cards not returned, fish not checked	75
Total estimated catch	505

This ratio assumes that the punch card rate of return is the same for anglers whose fish were not creel checked.

The contribution by stream of the projected catch of 505 king salmon was as follows: Anchor River, 170; Ninilchik River, 275; and Deep Creek, 60. The total estimated catch per stream was computed by multiplying the stream's relative contribution by the 75 unreported fish. This was then added to each stream's known harvest.

Of the total estimated 505 king salmon caught, 202 (40.0%) were creel checked. Limit catches (two fish per angler) comprised 30.0% of the reported harvest and were taken by 13.2% of the successful anglers. This is comparable to the 11.3% reported in 1969, but considerably lower than the 1966-1969 average of 19.2% (Table 5).

TABLE 5 Summary of Percent of Total Catch Comprising Season Limit and Percent Successful Anglers taking Season Limit, 1966-1970.

Year	% Total Catch Comprising Limit Catches (2 fish/angler)	% Successful Anglers Taking Season Limit
1966	33.3	21.2
1967	36.1	22.0
1968	38.4	22.1
1969	20.3	11.3
1970	30.0	13.2
1966-1969 Average	32.0	19.2

Escapement:

Due to unfavorable weather and stream conditions, no aerial surveys were conducted in 1970. A foot survey conducted on the Anchor River revealed 424 king salmon in the index area. The total estimated escapement of 1,850 king salmon was extrapolated in the following manner.

$$\frac{\text{Average number king salmon in index area 1964-1969}}{\text{Average king salmon escapement 1964-1969}} = \frac{\text{Number king salmon in index area 1970}}{\text{Estimated escapement 1970}}$$

$$\frac{311}{1,358} = \frac{424}{x}$$

$$x = 1,850$$

The average was computed from 1964 through 1969, as the index areas during this period corresponded to the 1970 index area. This is an increase of 47.9% over the preceding 10-year average of 1,251.

Table 6 summarizes Anchor River minimum spawning escapements, sex ratios, and estimated spawning females for 1960 through 1970. Adding the estimated sport harvest of 170 king salmon to the estimated escapement of 1,850 fish, the total run is estimated at 2,020 fish.

The Anchor River male-to-female ratio was 0.9:1. An estimated 974 females spawned in 1970 (Table 6).

TABLE 6 Summary of Escapement, Sex Ratios, and Estimated Number of Spawning Female King Salmon, Anchor River, 1960-1970.

Year	Est. Tot. Escapement	Male:Female Sex Ratio	Est. Spawning Females	Method of Determination
1960	1,200	0.9:1	631	Aerial & foot survey
1961	850	1.2:1	386	Aerial & foot survey
1962	970	0.8:1	539	Aerial & foot survey
1963	1,340	1.0:1	670	Aerial & foot survey
1964	1,700	1.4:1	708	Aerial & foot survey
1965	1,600	1.7:1	593	Aerial & foot survey
1966	1,325	0.8:1	736	Foot survey
1967	1,195	0.7:1	700	Aerial & foot survey
1968	530	1.7:1	195	Aerial & foot survey
1969	1,800	1.5:1	720	Aerial & foot survey
1970	1,850	0.9:1	974	Foot survey
1960-1969 Average	1,251	1.2:1	587	

Due to adverse weather conditions which prevailed in 1970, no foot urveys were conducted on the Niniichik River and Deep and Stariski creeks.

Table 7 describes the relative effectiveness of king salmon survey echniques from 1962 through 1970. The percent of the run within the index reas as estimated by aerial surveys has varied considerably from year to ear. This is believed to be due to differences in weather conditions, tream conditions, and observers. Stream conditions are probably the reatest contributing factor to these fluctuations since water levels may nfluence the distribution of salmon observed in the index areas (Watsjold, 970).

ABLE 7 Relative Effectiveness of King Salmon Aerial and Foot Surveys on Kenai Peninsula Streams.

Stream	Year	Est. % Run Within Index Area by Aerial Survey	% Success Aerial vs. Foot Surveys Within Index Areas
nchor River	1962	31/212 = 14.6	31/196 = 15.8
	1963	112/454 = 24.7	112/239 = 46.9
	1964	89/299 = 29.8	89/379 = 23.5
	1965	39/347 = 11.2	39/180 = 21.7
	1966	No aerial survey	/300 = --
	1967	64/210 = 30.5	64/363 = 17.6
	1968	42/114 = 36.8	42/176 = 23.9
	1969	45/288 = 15.6	45/281 = 16.0
	1970	No aerial survey	/424 = --
eep Creek	1962	28/ 89 = 31.5	28/191 = 14.7
	1963	138/400 = 34.5	138/258 = 53.5
	1964	57/275 = 20.7	57/165 = 34.5
	1965	31/167 = 18.6	31/128 = 24.2
	1966	No aerial survey	/107 = --
	1967	20/139 = 14.4	20/ 38 = 52.6
	1968	25/ 67 = 37.3	25/ 73 = 34.2
	1969	13/115 = 11.3	13/108 = 12.0
	1970	No aerial survey	No foot survey
inilchik River	1962	15/ 47 = 31.9	15/143 = 10.5
	1963	73/179 = 40.8	73/193 = 37.8
	1964	76/200 = 38.0	76/347 = 21.9
	1965	70/224 = 31.3	70/219 = 21.9
	1966	No aerial survey	/231 = --
	1967	59/100 = 59.0	59/213 = 27.7
	1968	19/ 31 = 61.3	19/126 = 15.1
	1969	22/ 87 = 25.3	22/191 = 11.5
	1970	No aerial survey	No foot survey

TABLE 7 (Cont.) Relative Effectiveness of King Salmon Aerial and Foot Surveys on Kenai Peninsula Streams.

Stream	Year	Est. % Run Within Index Area By Aerial Survey	% Success Aerial vs. Foot Surveys Within Index Areas
Stariski Creek	1962	3/ 18 = 16.7	3/ 44 = 6.8
	1963	11/ 53 = 20.8	11/ 74 = 14.9
	1964	61/152 = 40.1	61/234 = 26.1
	1965	23/ 94 = 24.5	23/ 80 = 28.8
	1966	No aerial survey	No count
	1967	13/ 31 = 41.9	13/ 82 = 15.9
	1968	7/ 29 = 24.1	7/ 30 = 23.3
	1969	8/ 24 = 33.3	8/ 70 = 11.4
	1970	No aerial survey	No foot survey

Population Structure - Anchor River:

Information on the population structure of the Anchor River was collected from 69 sport-caught king salmon. Figure 1 shows the length frequencies of the sport harvest.

Age group frequencies and mean lengths by sex from 1960 through 1970 are presented in Table 8. These age groups do not necessarily represent the true age composition of the population. The sample size is small in relation to the total population, and data was collected over a relatively short period of time. The dominant age group was 1.3 (54.4%) followed by 1.4, which comprised 27.3% of the sample. Table 9 summarizes king salmon length frequency data collected from 1964 through 1970. Table 10 presents the number, percentage, mean fork length, and range by sex for the various age groups.

Population Structure - Ninilchik River:

Population data was compiled by analyzing 127 sport-caught king salmon. Figure 2 presents the length frequency of the 1970 sample. Table 11 presents the king salmon group frequency by percent from 1966 through 1970. As occurred in 1969, age group 1.3 was the dominant age class, comprising 55.0% of the sample, followed by age class 1.4, comprising 28.0%.

Table 12 presents the number, percentage, length range, and mean fork length by sex for the various age groups.

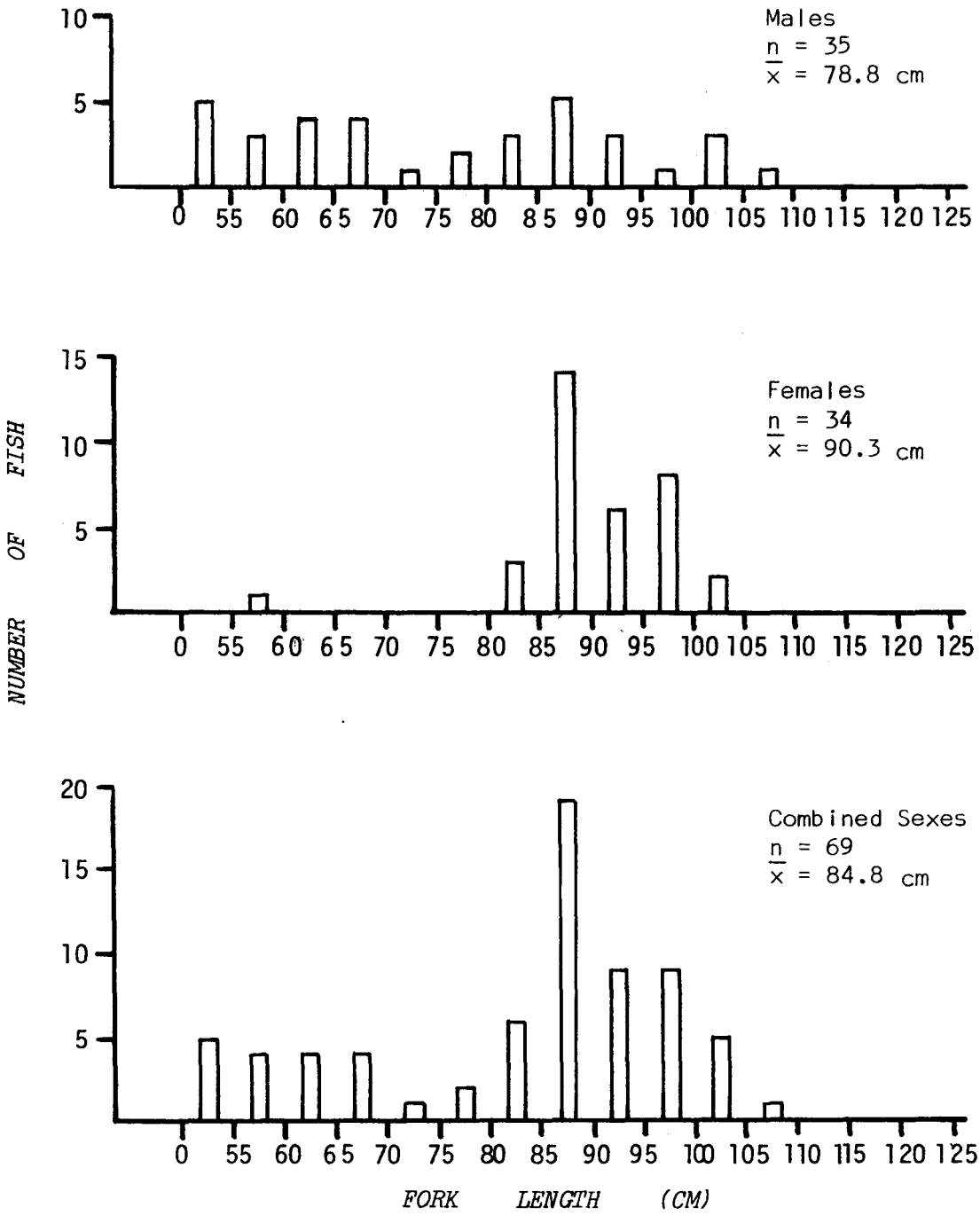

FIGURE 1 LENGTH FREQUENCY OF SPORT-CAUGHT KING SALMON, ANCHOR RIVER, 1970.

TABLE 8 Age Class Frequency and Mean Length by Sex of Anchor River King Salmon Samples, 1960-1970.

Year	Sample Size for Age Determination	Age Group by %					Mean Length in cm (No. in Sample)		
		1.1	1.2	1.3	1.4	All Other	Male	Female	Combined
1960	199	2.7	6.5	76.0	11.0	3.8	82.3 (88)	82.3 (95)	84.1 (183)
1961	112	2.9	10.6	21.1	64.4	1.0	87.0 (58)	93.8 (49)	90.1 (107)
1962	47	--	31.9	40.4	27.7	--	79.5 (31)	85.9 (40)	83.1 (71)
1963	99	10.1	19.2	49.5	20.2	1.0	71.9 (77)	90.6 (75)	81.1 (152)
1964	--	Carcasses only - No Sport Fishery					86.1 (60)	91.5 (44)	88.4 (104)
1965	--	Carcasses only - No Sport Fishery					83.5 (106)	90.7 (62)	86.1 (168)
1966	151	2.6	19.2	42.4	30.5	5.3	77.6 (79)	89.5 (95)	84.1 (174)
1967	112	1.8	8.9	22.3	66.1	0.9	91.8 (97)	94.1 (135)	93.2 (232)
1968	168	0.6	20.8	31.0	46.4	1.2	80.8 (151)	91.7 (116)	85.5 (267)
1969	36	2.8	47.2	38.9	11.1	--	74.8 (102)	89.7 (74)	81.1 (176)
1970	54	--	18.3	54.4	27.3	--	78.8 (31)	90.3 (34)	84.8 (65)
1960-1969 Avg.*	115	2.9	20.5	40.2	34.7	1.7	81.5 (85)	90.0 (79)	85.7 (163)

*Excluding 1964 and 1965.

TABLE 9 A Summary of King Salmon Length Frequency Data, Anchor River, 1964-1970.

Year	Length in cm															Tot. Fish	Avg. Length
	0-50	55	60	65	70	75	80	85	90	95	100	105	110	115	120		
1964 - Male	5	-	1	1	4	5	3	4	4	9	6	7	8	3	-	60	86.1
Female	-	-	-	-	-	-	-	3	16	13	7	5	-	-	-	44	91.5
Combined	5	-	1	1	4	5	3	7	20	22	13	12	8	3	-	104	88.4
1965 - Male	2	2	8	8	17	4	3	2	8	12	18	17	3	2	-	106	83.5
Female	-	-	-	-	-	-	3	9	21	14	9	5	-	1	-	62	90.7
Combined	2	2	8	8	17	4	6	11	29	26	27	22	3	3	-	168	86.1
1966 - Male	-	4	16	9	2	1	3	8	15	12	5	2	1	1	-	79	77.6
Female	-	-	-	1	-	1	2	18	30	20	15	8	-	-	-	95	89.5
Combined	-	4	16	10	2	2	5	26	45	32	20	10	1	1	-	174	84.1
1967 - Male	6	-	3	5	3	2	5	8	7	6	3	6	22	19	2	97	91.8
Female	-	-	-	-	3	-	2	6	26	29	37	28	4	-	-	135	94.1
Combined	6	-	3	5	6	2	7	14	33	35	40	34	26	19	2	232	93.2
1968 - Male	9	-	4	23	22	9	4	7	12	18	11	14	11	5	2	151	80.8
Female	-	-	-	-	-	1	1	16	26	31	31	7	3	-	-	116	91.7
Combined	9	-	4	23	22	10	5	23	38	49	42	21	14	5	2	267	85.5
1969 - Male	2	4	11	22	14	7	4	7	5	10	6	5	2	2	1	102	74.8
Female	-	-	-	1	-	-	4	10	27	14	13	4	1	-	-	74	89.7
Combined	2	4	11	23	14	7	8	17	32	24	19	9	3	2	1	176	81.1
1970 - Male	4	1	4	3	4	1	2	3	5	3	1	3	1	-	-	35	78.8
Female	-	-	-	1	-	-	-	3	14	6	8	2	-	-	-	34	90.3
Combined	4	1	4	4	4	1	2	6	19	9	9	5	1	-	-	69	84.8

TABLE 10 The Number, Percentage, Range, and Mean Fork Length, by Sex of King Salmon, by Age Group, Anchor River, 1970.

Age Group	No.	%	Length (mm) Range	Mean
1.2 - Male	10	18.5	540 - 680	618
- Female	1	1.9	635	635
1.3 - Male	12	22.2	810 - 1005	879
- Female	19	35.1	840 - 965	887
1.4 - Male	3	5.6	965 - 1040	1012
- Female	9	16.7	875 - 1035	970

TABLE 11 Age Group Frequency of King Salmon by Percent, Ninilchik River, 1966-1970.

Year	Sample Size	Age Group 1.1	1.2	2.2	1.3	2.3	1.4	2.4	1.5
1966	82	-	22.0	-	45.3	2.2	30.5	-	-
1967	78	2.6	6.4	1.3	30.8	1.3	56.3	-	1.3
1968	100	4.0	42.0	1.0	21.0	1.0	30.0	1.0	-
1969	64	-	34.4	3.1	50.0	-	12.5	-	-
1970	100	-	17.0	-	55.0	-	28.0	-	-

TABLE 12 The Number, Percentage, Range, and Mean Fork Length, By Sex of King Salmon, by Age Group, Ninilchik River, 1970.

Age Group	No.	%	Length (mm) Range	Mean
1.2 - Male	17	17.0	540 - 675	615
- Female	1	1.0	595	595
1.3 - Male	23	23.0	610 - 1000	890
- Female	31	31.0	762 - 920	860
1.4 - Male	10	10.0	890 - 1205	1000
- Female	18	18.0	900 - 1070	965

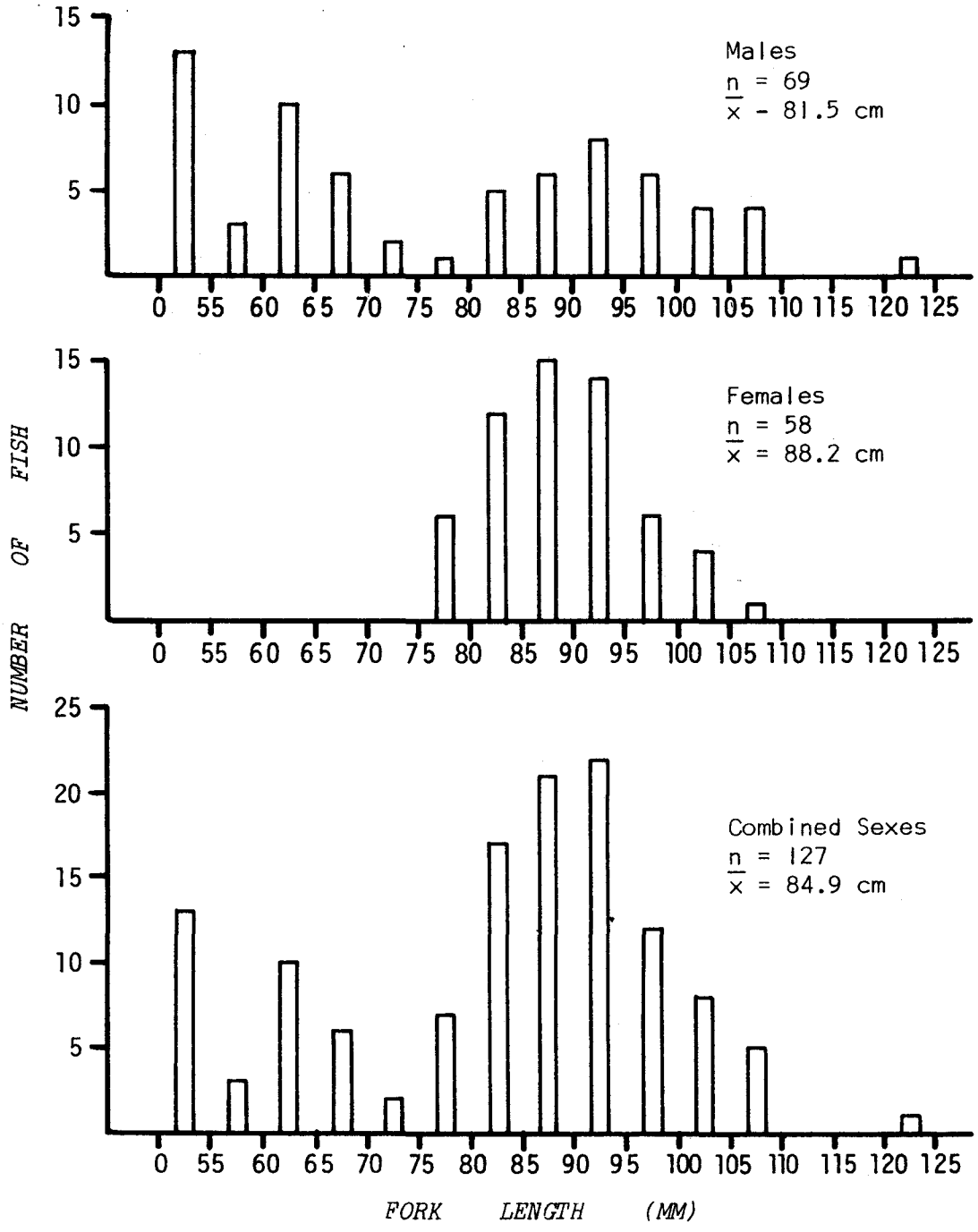

FIGURE 2 LENGTH FREQUENCY OF SPORT-CAUGHT KING SALMON, NINILCHIK RIVER, 1970.

TABLE 13 Summary of Length Frequencies, Sample Sizes, and Mean Length, King Salmon, Ninilchik River, 1964-1970.

Year	Length in cm 0-50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	Tot. Fish	Avg. Length
1964 - Male	6	-	1	6	5	7	-	4	7	5	4	4	7	1	-	-	57	80.5
Female	-	-	-	-	-	-	1	16	12	11	3	-	-	-	-	-	43	86.9
Combined	6	-	1	6	5	7	1	20	19	16	7	4	7	1	-	-	100	83.3
1965 - Male	5	1	-	4	2	-	-	3	7	5	7	6	3	1	2	-	46	84.9
Female	-	-	-	-	-	-	2	9	15	12	7	2	-	-	-	-	47	89.3
Combined	5	1	-	4	2	-	2	12	22	17	14	8	3	1	2	-	93	87.1
1966 - Male	-	1	9	12	3	-	3	7	8	8	4	1	1	2	-	-	59	77.8
Female	-	-	-	-	-	1	3	12	12	14	7	2	-	-	-	-	51	88.3
Combined	-	1	9	12	3	1	6	19	20	22	11	3	1	2	-	-	110	82.7
1967 - Male	2	2	3	-	1	1	1	4	3	4	2	5	4	1	-	-	33	80.4
Female	-	-	-	-	-	-	4	6	8	11	13	6	1	-	-	-	49	91.4
Combined	2	2	3	-	1	1	5	10	11	15	15	11	5	1	-	-	82	87.3
1968 - Male	5	-	5	30	14	-	2	-	4	3	1	3	1	-	-	-	68	67.4
Female	-	-	-	-	1	1	-	2	12	12	11	1	-	-	-	-	40	90.9
Combined	5	-	5	30	15	1	2	2	16	15	12	4	1	-	-	-	108	76.1
1969 - Male	12	7	14	20	17	5	6	10	11	14	8	5	-	-	-	-	129	71.6
Female	-	-	-	-	2	-	3	24	18	10	9	1	-	1	-	-	68	87.1
Combined	12	7	14	20	19	5	9	34	29	24	17	6	-	1	-	-	197	76.9
1970 - Male	6	7	3	10	6	2	1	5	6	8	6	4	4	-	-	1	69	81.5
Female	-	-	-	-	-	-	6	12	15	14	6	4	1	-	-	-	58	88.2
Combined	6	7	3	10	6	2	7	17	21	22	12	8	5	-	-	1	127	84.9

A summary of length frequencies, sample sizes, and mean lengths from 1964 through 1970 is presented in Table 13. The large size for males may be attributed to the relatively small percentage of age 1.2 males in the sample.

Population Structure - Deep Creek:

The 15 fish sample collected from Deep Creek was too small to be representative of the population. Table 14 presents a summary of age group frequency by percent for 1967 through 1970.

TABLE 14 Age Group Frequency of King Salmon by Percent, Deep Creek, 1967-1970.

Year	Sample Size	Age Group								
		1.1	2.1	0.2	1.2	2.2	1.3	2.3	1.4	2.4
1967	107	6.5	0.9	0.9	21.6	3.7	29.0	0.9	35.6	0.9
1968	105	2.9	-	-	32.4	3.8	32.4	0.9	26.7	0.9
1969	28	-	-	-	78.6	-	17.8	-	3.6	-
1970	15	-	-	-	20.0	-	46.7	-	33.3	-

Kenai River King Salmon Fishery

The Kenai River king salmon fishery was continuous from May 30 through July 31. Due to the length of the season, the absence of a quota, and light fishing pressure, no sampling was conducted.

Punch-card returnees reported taking 237 king salmon over 20 inches in length, and an additional 96 "jacks" under 20 inches. The peak of the harvest occurred between June 21 and July 27, when 25.7% of the total catch was taken. Table 15 presents the total harvest reported by punch-card returnees.

TABLE 15 Kenai River King Salmon Harvest by Weekly Period, May 30 through July 31, 1970.

Weekly Period	No. Fish	% Tot. Harvest
5/30 - 6/ 5	8	3.4
6/ 6 - 6/12	4	1.7
6/13 - 6/19	33	13.9
6/20 - 6/26	62	26.2
6/27 - 7/ 3	35	14.8
7/ 4 - 7/10	29	12.2
7/11 - 7/17	22	9.3
7/18 - 7/24	24	10.1
7/25 - 7/31	20	8.4
Total	237	100.0

Silver Salmon Tagging in Mud Bay

A silver salmon, O. kisutch, tagging program was initiated in the Mud Bay area of Kachemak Bay in cooperation with the Commercial Fisheries Division. The area is being increasingly utilized by the sport fisherman angling from shore. Tagging was undertaken to determine if these were local stocks or were bound for upper Cook Inlet.

The tagging program commenced on August 15 and terminated on August 26 with 233 silver salmon being tagged with Petersen disc tags. Tagged fish recovery was effected by monitoring the commercial harvest, foot surveys of streams tributary to Kachemak Bay, and by a partial creel census of the Anchor River. A total of 54 (23.2%) of the tagged fish were recovered. Recoveries were: one from the Mud Bay sport fishery, nine from a foot survey of the Fox River, with the remainder being divided between commercial hand purse seine gear and subsistence gill nets. No recoveries were made from 166 silver salmon checked in the Anchor River sport catch. This information, when evaluated with the Kachemak Bay returns, suggests the stocks remain in the Kachemak Bay area to spawn.

The commercial catch of silver salmon for the Mud Bay and upper Kachemak Bay area was 2,519 fish. The subsistence catch for the same area was 1,079. The sport harvest in this area was believed to be less than 500 fish.

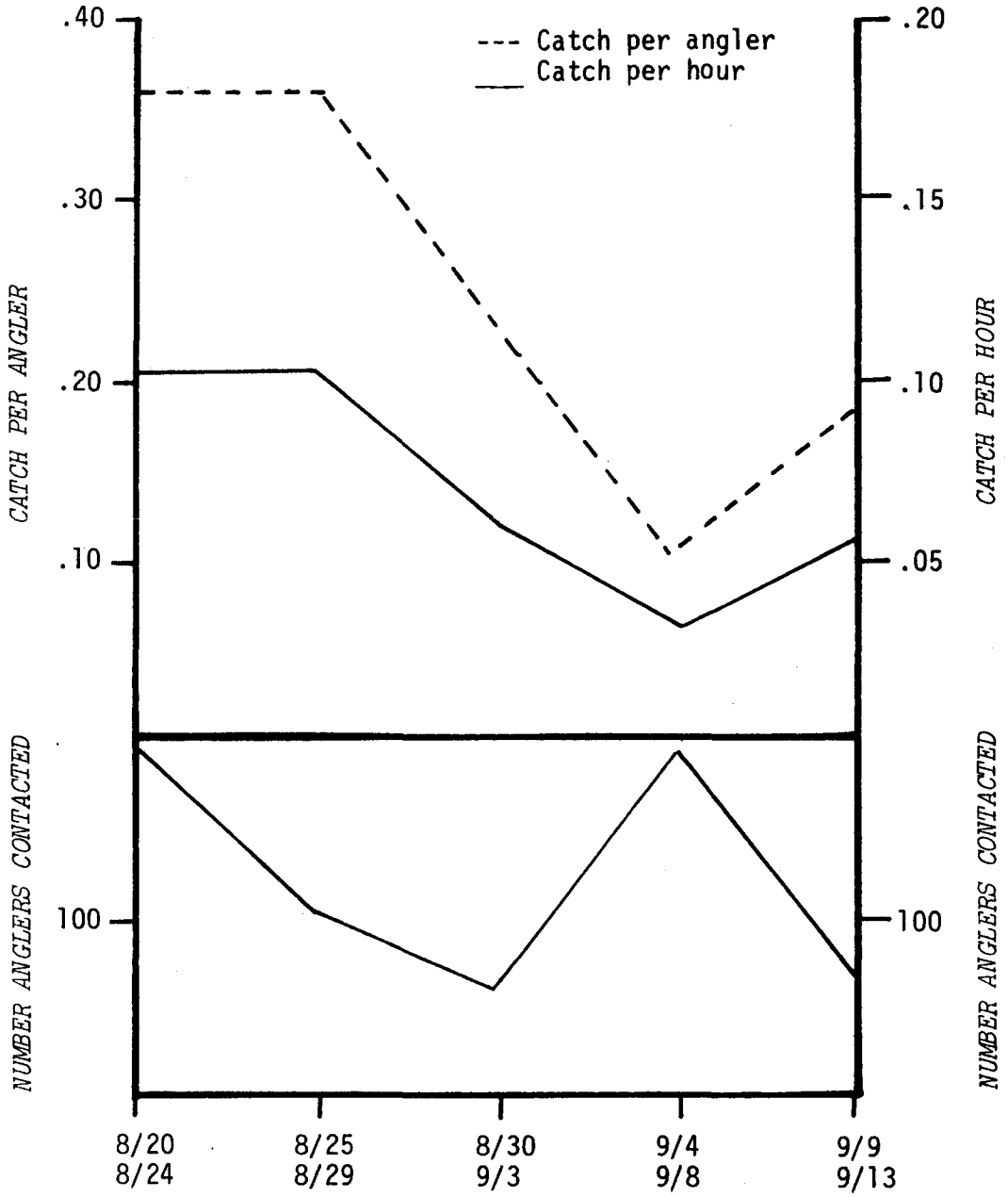

FIGURE 3 SILVER SALMON CATCH PER HOUR, CATCH PER ANGLER, AND NUMBER OF ANGLERS BY CREEL CENSUS PERIOD, ANCHOR RIVER, 1970.

Creel Census - Anchor River

To complement the silver salmon tagging program in Mud Bay, a partial creel census of the Anchor River was conducted during August and September. The census commenced August 20 and terminated on September 13, with 15 creel checks being made. Creel census information revealed that 642 anglers reported fishing 2,050 hours and harvested 166 silver salmon; 36 Dolly Varden, Salvelinus malma; and 5 steelhead, Salmo gairdneri. The silver salmon catch per angler was 0.26 and the catch per hour was 0.08. No tagged silver salmon were reported or observed during the census period.

The catch per angler, catch per hour, and number of anglers contacted are graphically presented in Figure 3. Figure 3 indicates that the run was already in progress at the initiation of the census and began to decline following the second census period.

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